apparatus for energizing the cooled closed rotor and stator loops and establishing magnetic linkages therebetween forming a bearing supporting a rotation of the rotor in an equilibrium stable free state within the stator.

2. The bearing apparatus set forth in claim 1 further comprising

sensors mounted on the stator within a magnetic field zone of the stator loops for registering linear shifts and angular declinations of the rotor relative to the stator.

3. The bearing apparatus set forth in claim 2 wherein the rotor loops each comprise

a planar short-circuited coil wound of a superconductive wire and mounted on an end of a shaft of the rotor.

4. The bearing apparatus set forth in claim 3 wherein the stator loops each comprise

a planar short-circuited coil wound of the superconductive wire and angularly positioned at ends of the stator around the closed rotor loops.

5. The bearing apparatus set forth in claim 2 wherein the closed stator loops each comprise

a planar short-circuited coil wound of the superconductive wire configured to have two non-equal circular-arc sides joined at the ends thereof by radial segments.

6. The bearing apparatus set forth in claim 1 wherein the rotor comprises

a plurality of closed rotor loops each wound as a coil of the superconductive wire around the rotor and each positioned in a circular plane about an axis of the rotor.

7. The bearing apparatus set forth in claim 6 wherein the stator comprises

a plurality of closed stator loops each wound as a coil of the superconductive wire and ones of which are mounted in the stator in a plane around the rotor adjacent to a corresponding one of the closed rotor loops.

8. The bearing apparatus set forth in claim 1 wherein the rotor comprises

a plurality of closed rotor loops each wound as a coil of the superconductive wire around the rotor and each mounted on the rotor shaft in adjacent planes each perpendicular to an axis of the rotor.

9. The bearing apparatus set forth in claim 8 wherein the stator comprises

a plurality of closed stator loops each wound as a coil of the superconductive wire and each angular spaced and mounted on the stator between ones of the rotor closed short-circuited loops so as to be off-center of the axis of the rotor.

10. The bearing apparatus set forth in claim 1 wherein the rotor comprises

a pair of closed rotor loops each wound as a coil of the superconductive wire and mounted on an end of a shaft of the rotor in a plane perpendicular to an axis of the rotor shaft.

11. The bearing apparatus set forth in claim 10 wherein the stator comprises

a pair of closed stator loops each having three coils wound of the superconductive wire and each coil angularly spaced adjacent to another one of the coils and wherein each closed stator loop is mounted on an end of the stator in a

plane parallel to a corresponding one of the closed rotor loops.

12. Bearing apparatus comprising

a rotor having a pair of closed rotor loops each formed of a planar short-circuited coil wound of a superconductive wire having zero electrical resistance at a temperature below a superconductivity transition temperature and which are mounted on a shaft of the rotor at each end of the rotor,

a stator enclosing the rotor and having closed stator loops formed as planar short-circuited coils wound of the superconductive wire configured to have two non-equal circular-arc sides joined at the ends thereof by radial segments and each angularly positioned at ends of the stator around the closed rotor loops,

a cooling agent for cooling the closed rotor and stator closed loops to a temperature below the superconductivity transition temperature,

apparatus for energizing the cooled closed rotor and stator loops and establishing magnetic linkages therebetween forming a bearing supporting a rotation of the rotor in an equilibrium stable state within the stator, and

sensors mounted on the stator within a magnetic field zone of the closed stator loops and rotor loops magnetic linkages for registering linear shifts and angular declinations of the rotor relative to the stator.

13. A planar superconductive bearing structure comprising

a rotatable member formed as a short-circuited coil wound of a superconductive wire having zero electrical resistance at a temperature below a superconductivity transition temperature,

a plurality of stationary members each formed as closed loops formed as planar short-circuited coils wound of the superconductive wire configured to have two non-equal circular-arc sides joined at the ends thereof by radial segments and each angularly positioned around the closed rotatable member,

a cooling agent for cooling the closed rotatable and stationary member closed loops to a temperature below the superconductivity transition

temperature, and

apparatus for energizing the cooled rotatable and stationary member closed loops and establishing magnetic linkages therebetween forming a bearing supporting a rotation of the rotatable member in an equilibrium stable free state within the stationary members.

14. Apparatus for supporting a rotor with respect to a stator comprising

a plurality of closed rotor short-circuited loops formed of a material having zero electrical resistance at a temperature below a superconductivity transition temperature and each of which are wound as a coil of wire around the rotor and positioned along the rotor in a circular plane about an axis of the rotor,

a plurality of closed stator loops each wound as a coil of the superconductive wire and each mounted on the stator and each angularly positioned in a plane round the rotor adjacent to a corresponding one of the closed rotor short-circuited loops,

a cooling agent for cooling the closed rotor and stator loops to a temperature below the superconductivity transition temperature, and

apparatus for energizing the cooled closed rotor and stable loops and establishing magnetic linkages therebetween forming a bearing supporting a rotation of the rotor in a stable equilibrium free state within the stator.

15. Apparatus for supporting a rotor with respect to a stator comprising

a rotor having a plurality of closed rotor short-circuited loops each wound as a coil of superconductive wire having zero electrical resistance at a temperature below a superconductivity transition temperature and each mounted on a shaft of the rotor in a plane perpendicular to an axis of the rotor,

a stator enclosing the rotor and having a plurality of closed stator loops each wound as a coil of the superconductive wire and each spaced and mounted on the stator between ones of the rotor closed short-circuited loops so as to be off-center of the rotor axis,

a cooling agent for cooling the closed rotor and stator closed loops to a temperature below the superconductivity transition temperature, and

apparatus for energizing the cooled closed rotor and stator loops and establishing magnetic linkages therebetween forming a bearing supporting a rotation of the rotor in a stable equilibrium free state within the stator.

16. Apparatus for supporting a rotor with respect to a stator comprising

a pair of closed rotor short-circuited loops each wound as a coil of superconductive wire having zero electrical resistance at a temperature below a superconductivity transition temperature and each mounted on an end of a shaft of the rotor in a plane perpendicular to an axis of the rotor,

a pair of planar stator members each having three coils wound of the superconductive wire and each coil angularly spaced adjacent to another one of the coils and wherein the three closed stator coils are mounted on an end of the stator in a plane parallel to and adjacent to a corresponding one of the closed rotor loops,

a cooling agent for cooling the closed rotor and stator closed loops to a temperature below the superconductivity transition temperature, and

apparatus for energizing the cooled closed rotor and stator loops and establishing magnetic linkages therebetween forming a bearing supporting a rotation of the rotor in a stable equilibrium free state within the stator.

17. The supporting apparatus set forth in claim 2 wherein the rotor loops each comprise

a planar superconductive short-circuited coil wound from thin niobium-titanium wire.

18. The supporting apparatus set forth in claim 2 wherein the rotor loops each comprise

a planar superconductive short-circuited coil wound from thin niobium-tin wire.

19. The supporting apparatus set forth in claim 2 wherein the stator loops each comprise

a planar superconductive short-circuited coil wound from thin niobium-titanium wire.

20. The supporting apparatus set forth in claim 2 wherein the stator loops each comprise

a planar superconductive short-circuited coil wound from thin niobium-tin wire.

21. The supporting apparatus set forth in claim 1 wherein ones of said loops comprise

a two-state switch having a resistive and a short state.

22. The supporting apparatus set forth in claim 4 wherein ones of said planar coils comprise

a two-state switch having a resistive and a short state formed of coils of wire wound around a section of the planar short-circuited coils.

23. Apparatus for supporting a rotor with respect to a stator comprising

a rotor having a pair of closed rotor loops each formed of a planar short-circuited coil wound of a superconductive wire having zero electrical resistance at a temperature below a superconductivity transition temperature and which are mounted on a shaft of the rotor at each end of the rotor,

a stator enclosing the rotor and having closed stator loops formed as planar short-circuited coils wound of the superconductive wire configured to have two non-equal circular-arc sides joined at the ends thereof by radial segments and each angularly positioned at ends of the stator around the closed rotor loops,

a two-state switch having a resistive and a short state formed of

coils of wire wound around a section of the planar short-circuited coils of the closed stator loops,

a cooling agent for cooling the closed rotor and stator closed loops to a temperature below the superconductivity transition temperature,

apparatus for energizing the cooled closed rotor and stator loops and the two-state switch and establishing frozen magnetic linkages between the closed rotor and stator closed loops and forming a bearing supporting a rotation of the rotor in an equilibrium stable free state within the stator, and

sensors mounted on the stator within a magnetic field zone of the closed stator loops and rotor loops magnetic linkages for registering linear shifts and angular declinations of the rotor relative to the stator.

24. Rotor and stator superconductive bearing apparatus comprising

a pair of closed loops for use with a superconductive bearing rotor and stator each formed of a superconductive material having zero electrical resistance at a temperature below a superconductivity transition temperature and which are mounted in a heat sink material secured on a resistive heater attached to a backing material.

25. Stator superconductive bearing apparatus comprising

a plurality of closed stator loops each formed of a superconductive material configured to have two non-equal circular-arc sides joined at the ends thereof by radial segments and having zero electrical resistance at a temperature below a superconductivity transition temperature and which are mounted in a circular configuration in a heat sink material secured on a resistive heater attached to a backing material.

26. Superconductive bearing apparatus comprising

a thin layer of a resistive heater deposited on a flat backing,

a heat sink deposited on the resistive heater,

thin films of a superconductive material having zero electrical

resistance at a temperature below a superconductivity transition temperature are deposited in a sandwich configuration on the heat sink and which are etched to form a pattern of closed loops.

27. Superconductive bearing apparatus comprising

a plurality of closed loops each formed of a superconductive material configured in a square configuration and having zero electrical resistance at a temperature below a superconductivity transition temperature and which are mounted in rows and columns on a heat sink disk.

28. Superconductive bearing apparatus comprising

a plurality of closed loops each formed of a superconductive material configured in a square mesh of super thin closed loops and having zero electrical resistance at a temperature below a superconductivity transition temperature and which are mounted in rows and columns on a heat sink disk.

29. Superconductive bearing apparatus comprising

a plurality of closed loops each formed of a superconductive material configured in a circular configuration and having zero electrical resistance at a temperature below a superconductivity transition temperature and which are mounted in concentric rings of the circular closed loops on a heat sink disk.

30. Superconductive bearing apparatus comprising

a plurality of closed loops each formed of a superconductive material configured in a circular configuration and having zero electrical resistance at a temperature below a superconductivity transition temperature and which are mounted in concentric rings of small ones of the circular closed loops positioned between large ones of the circular closed loops on a heat sink disk.

31. Superconductive bearing apparatus comprising

a plurality of closed loops each formed of a superconductive

material configured in a circular configuration and having zero electrical resistance at a temperature below a superconductivity transition temperature and first ones of which are mounted in aligned rows and columns and second ones of which are mounted in aligned rows and columns and positioned in-between the first closed loops.

32. Superconductive bearing apparatus comprising

a plurality of closed loops each formed of a superconductive material configured in a square configuration and having zero electrical resistance at a temperature below a superconductivity transition temperature and first ones of which are mounted as a square mesh on an upper surface of a first heat sink and second ones of which are mounted as a square mesh on an upper surface of a second heat sink and mounted such that the second closed loops are positioned adjacent a lower surface of the first heat sink to correspond with the first closed loops.

33. A method of supporting a rotor within a stator by magnetic bearings comprising the steps of

arresting the rotor having closed rotor loops with respect to the stator having closed stator loops adjacent the closed rotor loops wherein the closed loops are formed of a superconductive material,

cooling the rotor and stator closed loops to a temperature below a superconductivity transition temperature and establishing a zero electric resistance of the closed loops,

energizing the closed loops and establishing a frozen magnetic linkage mode between the rotor and stator closed loops, and

freeing the rotor and enabling the rotor to rotate in an equilibrium stable state within the stator.

34. The method of claim 33 wherein the energizing step comprises the step of

enabling the cooled rotor and the stator closed loops to assume a

resistance state.

35. The method of claim 34 wherein the energizing step comprises the step of applying a current around a small part of the cooled rotor and stator closed loops to generate frozen magnetic linkages between the rotor and stator closed loops.

36. The method of claim 35 further comprising the step of registering linear shifts and angular declinations of the rotating rotor with respect relative to the stator.